ture differential for the blast in the checker is about 580° and of the gases about 940°. Through the checkerwork the convection currents act in the same direction as the flow of the blast and the gases. Therefore the convection circulation tends to make every particle of the gases brush every unit of surface. This fact was demonstrated many years ago by Peclet at the *Institut des Arts et Metiers,* at Paris, but is still ignored by many.

In the combustion chamber the convection currents will be in the reverse direction to the flow of the blast and the gases. For that reason, it is probable that temperatures taken slightly below the top of the dome would show a higher blast temperature than would be found at the hot-blast valve, lower down.

The study of Table No. 4 reveals several interesting facts in regard to the two-pass stove which was tested. Hot-blast stove temperatures are comparatively low, both as regards the temperatures realized from the burning of the gas and the hot-blast temperature. In this stove the gas-to-gas differential was about 600°, which is nearly double that for other types of regenerators. The rate of heating and cooling, that is, the average temperature change per second in the blast heating and the gases cooling is low. The checker contains 28 m^2 32 of heating surface per cubic meter of free air per second, or, if the average volume of the blast in the checker is considered, this ratio becomes 24 m^2 35. The rate of heat absorption by the blast averages 0.659 calories per square meter of heating surface per second. The fact that the isotherms at the upper end of the checker are much closer together than those lower down may be interpreted as indicating that this end of the checker worked too cold, due, possibly, to the greater heat loss through the walls and shell of the stove.

The usual thickness of the outer walls of stoves is 18 inches of brick, 450 mm, with an air space of from 1 to 2 inches. A cyclic

change in temperature occurs in the inner portion of this wall while the outer portion will give a temperature gradient toward the air space. Due to the fact that the heating and cooling periods are not equal and there is a constant heat or temperature loss through the wall, the analysis of this cycle is not simple. The central portion of the wall has a small temperature change. There is a constant flow of heat to the outer surface and a periodic flow from and to the inner wall surface, according to whether the stove is at the beginning or end of the heating or cooling period. The